

From Disaster Medicine Research Planning to Practice in Taiwan

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Abstract

The research concerning disaster mitigation and response involved many aspects. According to “the SOP of Disaster Medicine, 2003”, it covers three categories, that is, disaster response system, communication/computer science and database set-up. Because of the essential roles of disaster planning, we have to avoid the “paper plan syndrome”. It is thus important to make a complete cost-effectiveness evaluation for the overall disaster scientific technique researches. We therein evaluated the mode and the degree of putting research planning to real practice in central and local governments in Taiwan. We have been engaged in the related work in the past year and collected many invaluable information and data. We have studied accomplishments in SOP, impacts on related legal environments, effects on government ICS and hospital HEICS, and the distribution of resources. Our findings include that the overall disaster planning has gradually concentrated in the fewer research institutes in the past 5 years. The satisfactory ratio of the government in the results (and/or suggestions on SOP) disaster research is about 70-80%. The familiarity ratio of the government in the results (and/or suggestions on SOP) disaster research is about 70-75%. The ratio of the government enrolling the results (and/or suggestions on SOP) disaster research into the government SOP is about 25-30%. The ratio of the government developing SOP at the attitude of downward (that is, the government established SOP and ordered the related agencies to exert upon) is about 80%. Fifty percent of the results (and/or suggestions on SOP) disaster research that government SOP adapted is still at the stage of ‘rules on trial’. Forty percent of the government command systems are comparable the ICS structure. Sixty percent of the emergency response hospitals command system are comparable the HEICS structure. (*Ann Disaster Med. 2005;3:100-116*)

Key words: Disaster Medicine; Evidence-Based Medicine; Policy

Introduction

As stated in Article 1 of Disaster Prevention and Response Act, it has been incorporated for the development and improvement of a disas-

ter prevention and response system of functions to protect the safety of the people’s life and properties and conservation of the homeland. Not only the act has stated the agencies who

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shall be the central regulating authorities for the Disaster Prevention and Response, but it has also stated their related missions.

Since Taiwan is located in the earthquake zone and is an island country, with centralized population after urbanization, the loss on people and damage on economy will always be devastated, once a disaster occurs. The experience of 921 earthquake is the best proof.¹⁻⁵ After a disaster, it may possibly derive medical related issues, covering a broad layer of subjects, such as general assessment of incidence, emergency assessment on medical needs and investigation of contagious diseases, fast assessment on public health of disaster area, the function of disaster rescue command center, centralization of the injured and first aid location set up, communication on health related issues, organization and command system of the disaster area, medical treatment and transportation, coordination in support of medical aid organization, coordination of environmental health assessment and control of contagious diseases, assessment and report of medical needs after disaster, shelters and medical aids and supports after disaster.⁶⁻¹⁰

The definition of a disaster is “a bionomic huge impact between people and environment, which makes the people in this area, cannot manage it normally, but to rely on abnormal behavior or outside aids to overcome.” This incidence must have significant influence to the life or health of mankind. Also, the need of medical resources must exceed what the local area can provide. Then it can be called a disaster. At this time, any single organization or department will not be able to handle, but to integrate across other organizations and departments to gather resources and labor to manage

the impact brought by the disaster. Last three years, it looks great from the related technical research and planning to set up of the standard application regulation. However, it is essential for us to ask if standard application regulation is applicable national-wide.

Recently, the government and general public are in full effort on implementation of disaster prevention and response. Instant passing of Disaster Prevention and Response Act in 2000 is the best proof. Most of the scholars in our country believe that America, especially federal emergency management agency (FEMA), has the size and complete system. In the recent three year, the drafts by all levels of our national disaster plans are based on FEMA. Similar plans can be found every where, for example the application of hospital emergency incident command system (HEICS) and the establishment of disaster medical assistance team (DMAT). To establish a perfect disaster response system, an All-Hazard Model needs to be established.¹¹ To establish this model, it is required to standardize basically from command system, response plan to personnel training. However, to avoid the occurrence of ‘paper plan syndrome’, we therein studied accomplishments in standard operations procedure (SOP) s, impacts on related legal environments, effects on government ICS and hospital HEICS, and the distribution of resources in the last 5 years.

Materials and Methods

Information collection and organization

Our method of assessment will be based on our specialists’ meeting to decide the sample pollution and details of our assessment. Method of decision will be Delphi Technique. We will

use anonymous questionnaires with rewards, repeat the procedures, let the specialists decide and select the important representative topics for the details of assessment, in order to obtain objective analysis and results.

The basic process includes initial research and identification of problems, decision on the need of specialists, selection of specialists, preparation of contents and details for the questionnaires, mailing, receiving and analyzing questionnaires, summarizing and providing required information to variances for second questionnaire investigation. This process is repeated until uniform opinions are reached.

Second step is to allow specialists to divide their individual responsible areas and be responsible to compare the collected information from every counties and cities in the past three years with historical information, based on collected data and the details of assessment topics, for conclusions.

Also, more than 50 percent of the county or city departments of health will be selected randomly for actual visit and interview to ensure the accuracy and reliance of information. In addition, national medical centers will be visited and interviewed according to hospital assessment teams.

For the statistical analysis and comparison on information of every topics, the standard statistical methods of SSPS and Artificial Neural Network Prediction Model will be applied.

Area of investigation

We will focus on the assessment of the following related disaster medical areas, in order to understand the effectiveness of the related technical investigation plan to the standard of op-

eration and their influence to the existing policies.

A. Assessment on Execution of Disaster Technical Plan

- Assessment questionnaire prepared and developed from specialists' meeting on executive ability of disaster technical plan director
- Acceptance of disaster technical plan and its standard procedures by every level of governmental health department executive unit

- Inclusion of disaster technical plan and its standard procedures into the operational procedures of every level governmental health department executive unit

- i. Influential model from bottom to top
- ii. Generalization model from top to bottom

- Level of compulsory on the inclusion of disaster technical plan and its standard procedures into the operational procedures of every level governmental health department executive unit

- i. Compulsory Regulation

- ii. Prohibitory Regulation

- iii. Declaratory Regulation

- iv. Research Regulation

- Self-evaluation on the inclusion of disaster technical plan and its standard procedures into the operational procedures of every level governmental health department executive unit

B. Assessment on Influence of Disaster Technical Plan

- Understanding and Familiarity of every level of governmental health department executive unit and every level of emergency responsible hospitals on the standard procedures evolved from the technical plan

- Are the standard procedures evolved from the technical plan being implemented by every level of governmental health department

executive unit and every level of emergency responsible hospitals?

- Is there any revision on the standard procedures evolved from the technical plan by every level of governmental health department executive unit and every level of emergency responsible hospitals? If so, what is the revision and its reason?

- The compatibility of the standard procedures of technical plan and the actual operation of every level of governmental health department executive unit and every level of emergency responsible hospitals

If not compactable, what is the resolution model?

C. Cost Analysis of Disaster Technical Plan

- Assessment on influence, before and after, of technical plan and its standard procedures

- Assessment on completeness of disaster technical plan and its standard procedures: Does it cover the area that disaster medicine should have covered?

- Natural disaster, man made disaster and mixed disaster

- Technical data analysis and categorization of natural disaster, man made disaster and mixed disaster

- Covered area of disaster technical plan and its standard procedures

- Assessment on completeness of disaster technical plan database establishment

- Establishment of technical plan and its standard procedures, before and after

- Analysis on established model of integrated disaster technical plan and its standard procedures

- Singular disaster uniform management model and multiple disaster uniform management model

- Integrated disaster uniform management model and integrated disaster uniform management

D. Assessment on Influence of Disaster Technical Plan on Disaster Prevention and Response Act and its related law

- Analysis on the implementation progress and difficulty of Disaster Prevention and Response Act

- Comparison of Disaster Prevention Response Act and foreign disaster response model

- Investigation on compatibility of investigated result

- Establishment of ideal disaster prevention and response act and disaster response system

E. Response System Structure of Every Level of Governmental Health Department, Executive Unit, Members and Operational Model, and the comparison with ICS.

Major assessed topics include:

- Is it equipped with general ICS disaster response system structures, which is divided into four categories: Execution and Operation, Planning and Information, Logistics and Administration

- Are reserved staffs clearly arranged? Are their job descriptions clearly defined and strictly reinforced?

- Are the strengths of ICS being applied to improve its flexibility and simplicity? Can every category be divided into sub-categories if necessary?

- Do response system structure, members and operational model match the existing policies and its law?

- Co-influence between the recently improved response system structure, members and operational model and the existing policies and law

F. Response System Structure of Every Level of Emergency Responsible Hospital, Members and Operational Model (Including Intra-Hospital); and Its Comparison with HEICS.

Major assessed topics include:

- Is it equipped with general HEICS disaster response system structures, which is divided into four categories: Execution and Operation, Planning and Information, Logistics and Administration
- Are the strengths of HEICS being applied to improve its flexibility and simplicity? Can every category be divided into sub-categories if necessary?
- Are reserved staffs clearly arranged? Are their job descriptions clearly defined and strictly reinforced?
- Is HEICS being followed for actual and unplanned rehearsals?
- Do response system structure, members and operational model match the existing policies and its law?

G. Major Rehearsal Planning and Operational Model of Every Level of Governmental Health Department Executive Unit and Emergency Responsible Hospitals.

Major assessed topics include:

- Is there a complete plan?
- Is there any discussion on the plan feasibility?
- Are rehearsals carried out as planned?
- Is there any unplanned rehearsal?
- Is evaluation on the plan applicability actually being followed through?
- Is past disaster experience included into planning and rehearsal for evaluation and improvement?
- Do rehearsal planning and operational model match the existing policies and law?

- Co-influence between the recently improved rehearsal plan and operational model and the existing policies and law.

H Appropriation on Resource Allocation among Every Level of Governmental Health Department Executive Unit and Emergency Responsible Hospitals. Is resource allocation being evaluated in advance and retroactively?

Major assessed topics include:

- Is risk being analyzed according to accredited disaster risk analysis?

For example: disaster history risk weighting, damage risk weighting, major threat risk weighting and disaster possibility risk weighting

- Are advanced and retroactive evaluation and forecast model established?
- Are advanced and retroactive evaluation objective?
- Is the evaluation result proportional to resource allocation?
- Investigate its reasons if it is not proportional
- Co-influence between the actual situation of resource allocation and the existing policies and law

Results

According to National Science Council, Department of Health and its related department, total number of questionnaires sent to every disaster technical plan director in 2000 through 2003, excluding duplication and chief assemblers, is 298 and total number of questionnaire received is 150 (rate of return is 50.5%). The statistical information details are as follows:

Characteristics of research plans and principal investigators

The characteristics of research plans and principal investigators have been studied. The major investigated area of the plan is mainly earthquake (106/150, 71%) (Table 2). Nearly three-sixths (86/144, 59.7%) of research plans are focused on specific categories. The focus of research according to geographical distribution is mainly in mid-west Taiwan (47/102, 45.2%) (Table 3).

The research organization included government organizations (8/150, 5.3%), school (138/150, 92%), non-profit organizations (3/150, 2%) and private organization (1/150, 0.7%). Most of these organizations had members less than 50 persons (Table 4). The average research programs undergone or released for each institute was usually less than 5 (Table 5). The major financial grant was from National Science Council (138/150, 92%) and Department of Health (12/150, 8%).

As to the applicability and accessibility of the plans, three-sixths (96/148, 64.9%) of the principal investigators believed that their research results or related SOP could be accessible by the public and any organization. The mode or methods of the assessments would be mainly from database of educational institutions (68/146, 46.6%) (Table 6).

Impact of research plans on policy

In the viewpoint of principal investigators

Most of the principal investigators (100/139, 71.9%) did not think the results and related SOP of their researches were adopted by the government. Of 57 principal investigators who believed their researches have been adopted as part of the policy, most of them (33/57, 57.

9%) thought their SOP have been adopted by central government such as Department of Health (Table 7). And most of these investigators (48/50, 96%) also agreed that the policy was comparable with their researches.

In the viewpoint of government

Our plan is to interview Department of Health, National Fire Agency, Ministry of Interior, Taipei City Government, Kaohsiung City, Taipei County Government and related departments. Results are presented in two major categories: Central Governmental Organizations and Local Governmental Organizations.

As to acceptance of every governmental executive units on disaster technical plan and its standard procedures, the unsatisfactory rate was only 2% (Table 8). The same situation was found for local governmental executive units (0.9%) (Table 9). We therein evaluated the condition of inclusion of disaster technical plan and its standard procedures into the operational procedures of every level governmental health department executive unit and influential model from bottom to top and generalization model from top to bottom. More than 73% of the central governmental organization expressed that they were familiar with these research plans and related SOP (Table 10), as did local governments (Table 11). However, the percentages on inclusion of disaster technical plan and its standard procedures into the operational procedures of central and local governmental organization were low (24% and 31%, respectively) (Table 12 and 13). The overall major factors (for both central and local governments) that influence the government organization to adopt these plans and SOP into operational procedures included lack of spe-

cific agencies or staffs responsible for the category (36.7%), the bias in opinions between government and researchers (22.3%) and lack of legal support (21.7%).

As to the inclusion model of disaster technical plan and its standard procedures into the operational procedures used by central governmental organization, most of them adopted generalization model from government to institutions (83% for central government and 77% for local governments) (Table 14 and 15).

Discussion

This report demonstrated that the percentage of the government enrolling the results (and/or suggestions on SOP) of disaster research into the government SOP is still low in Taiwan. The mode of downward that means extending from government to private institutes is the favorable way according to our observations. However, there are some essential concepts that have to be mentioned to elucidate the difficulties of incorporating the research plans and related SOP into the governmental policies. The most important ones may be that the emergency management system of our government is still not an integrated emergency management system. The other one is our response system is multiplex response system that may be not so efficient in real conditions. In lack of legal basis, the systems still cannot be corrected in the near future.

Integrated emergency management system

Emergency management was existence within the complicated politics, economical and society situation. So that, it often lack a union and coordinate policy structure. United States state

superior association to set up the Integrated Emergency Management System, and this system was accepted by union emergency disaster management office. This mode was extremely to attach importance to practice. The hypothesis of this mode was no matter of naturally or artificially being disaster, it must be to draft out some possess collective characteristic medium of emergency administration. It includes regulation of shelter facilities, transport and supply of food and medical instrument, emergency communicate mode, continuity of law and order, action of community separate from hazard area. So, this mode was to place emphasis on a way for establish the emergency management mode. It was to take the 'All-Hazard Model, not the specially to distinguish each natural or man-made disaster. This model can have the following advantages. Firstly, this model is suitable for all emergency disaster, including natural or man-made disaster. Second, this model emphasizes the general response mode, including selection of shelter manner, command control, communicate manner, emergency service and emergency sources. Third, the management stage of emergency disaster was generalization. This disaster prevention, preparation, emergency and reconstruction measures are usually suitable for every emergency and at every area. Fourth, communication between the union and local government or each department of union government have to be generalized according this management model.

1. Emergency management

Usually apply to this four method to settle the emergency attack. (a) Engineering technology : it is not only to forecast occur of emergency

event. Also to prevent the unexpected response. An appropriate design of engineering technology and adequately conserve were optimum guarantee of emergency prevention and preparation ; (b) Community education : warning people about the management while emergency was occur, to reduce the loss of life and property ; (c) Emergency feedback : depend emergency search and medical system to reduce casualties ; (d) System inspection : investigate disaster with regard to community damage. Cooperation and coordinate between division of government level, government organizations, personal department and non-profit department to reduce over all period of disaster.

2. Emergency management stage

Emergency management can be divide into four stages: (a) Disaster prevention: It means the activities to be engaged to reduce the long-term risk of life and property while a natural or man-made disaster occurs. It includes legal modification, disaster insurance, employ management, risk drafting, safety rules, etc; (b) Disaster preparation: It includes emergency operation planning, alarm system, emergency operation center, emergency communication network, emergency community information, reciprocal agreement, resources management planning, emergency medical personnel training and rehearsal ; (c) Disaster response: It is an immediate method to reduce loss of property and life before, during or after an emergency situation. It includes implementation of emergency planning, emergency response guides for public, emergency medical system, reception and care, settlement and sheltered, search and rescue etc ; (d) Disaster

rehabilitation: It includes to reconstruct the important maintain system, recover the daily live status, including control of environment pollution, assistance of disaster unemployment and temporary residence settle-down as soon as possible.

3. Demands on governmental abilities

Integrated Emergency Management System should request the government to have the abilities listed below. (a) systematic organization and procedure; (b) arranged position for each professional in the system; (c) the constant linkage among each specialty activities; (d) interpretation of policy set-up and common language.

4. Emergency management procedure

The application procedure of Integrated Emergency Management System is constructed from three categories: (a) maximum capability required: review the emergency ability of union, state and local government, and the private or non-profit organization. It may be helpful in looking for the difference of capacity and ability between each other. In addition to offset and coordinate, it also expands the government emergency rescue ability; (b) optimally integrated plans: request the union, state and local government, and the private or not-for-profit organization able to draft a emergency operation planning. Government organization should to be responsible to bring up an annual development planning; (c) continual maintenance: Annual development report of government organizations should be revised gradually according to maintenance planning. In fact, Integrated Emergency Management System was a component authority system in which both state and local governments play the important roles.

According to the three operation procedures mentioned above, the member of emergency management system should be to step into emergency analysis firstly while a disaster occurs, to take prevention and emergency management, and to re-evaluate the outcome of the disasters.

General response model and specific response model

The most difference of emergency governance mode between our country and United States was use of general response model in the latter.¹¹ SO-called “general response model” is a concept that the types of demands was constant no matter what type of disasters occur. For example, the demand of food, residence, medical treatment and transport are the same no matter earthquake, floods or epidemic disaster happen. Therefore, it should be to establish unified emergency mode in management of unexpected situation. The work of the model depends on twelve emergency functions after the occurrence of disasters.

In Taiwan, governmental emergency response tends to take multiple emergency governance modes. This disadvantage was proved from the past emergency management. To use as SARS for example, authorities from the Department of Health can not be authorized to satisfy the other emergency functions or basic demands beyond medical care. Another example may be authorities of Atomic Energy Council also can not satisfy emergency functions or basic demands while nuclear events occur. It is thus necessary to evaluate critically about the governmental emergency response model in our country.

In summary, this report demonstrated that

the incorporation of research plans and proposed SOP into formal governmental policies is adequately low although most of the agencies expressed satisfactory to these research results. The major problems that have to be addressed and resolved are lack of specific agencies or staffs responsible for the category, the differences in attitudes between government and researchers, and lack of adequate legal basis.

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10. What is the length of the plan?

- ① 1 year ② 2 years ③ 3 years ④ 4 years ⑤ 5 years

10

11. How many similar projects are you conducting concurrently?

- ① 1 to 2 ② 3 to 4 ③ 4 to 5 ④ 6 to 7 ⑤ 8 and above

11

Part 3: Organizational Structure of Your Department

Do not write beyond the dot line_

1. What is your organization?

- ① Government ② School ③ Non-profit/Non-governmental ④ Private Organization

12

2. How many staffs in your organization?

- ① 50 and below ② 51 to 100 ③ 101 to 150 ④ 151 to 200 ⑤ 201 and above

13

3. How many disaster related research reports or plan have you released?

- ① less than 5 ② 5 to 10 ③ 11 to 15 ④ 16 to 20 ⑤ 21 and above

14

4. Who are the major consigners of your research?

- ① National Science Council ② Department of Health ③ Environmental Protection Administration of Executive Yuan ④ County or City Department of Health ⑤ Other _____

15

5. What is your operational model?

- ① Research Grant ② National Assistance ③ Public Donations ④ Other

16

Part 4: Your Organization and Research Plan

Do not write beyond the dot line

1. How many disaster related research reports and plans have you released from 1999 to present?

- ① 5 or less ② 6 to 10 ③ 11 to 15 ④ 16 to 20 ⑤ 21 and above

17

2. How many staffs in your research team?

- ① 5 or less ② 6 to 10 ③ 11 to 15 ④ 16 to 20 ⑤ 25 and above

18

3. What is the education of your research team director?

- ① Ph. D. ② Master ③ Bachelor ④ High School

19

4. What is (are) your major research subject(s) of your research team? (Select all if applicable)

- ① Disease ② Earthquake ③ Flood ④ Nuclear and Biochemical ⑤ Typhoon
⑥ Fire ⑦ Terrorism ⑧ Other _____

20

5. Is your research focus on specific area? (If no, go to question 7)

- ① Yes ② No

21

6. Which area is your research focus on?

- ① Taipei City ② Kaohsiung City ③ Northern Taiwan ④ Middle West of Taiwan ⑤ Southern Taiwan ⑥ Eastern Taiwan

22

7. How many plan have you conducted this year?

- ① 1 to 2 ② 3 to 4 ③ 4 to 5 ④ 6 to 7 ⑤ 8 and above

23

8. Will your plan and research results be accessible by the public and any

24

9. Where can the public and any organization get access of your research plan and results (Select all if applicable) 25
① Internet ② Database of Department of Health ③ Database of Emergency Medical Network ④ Library ⑤ Database of Educational Institutions
10. Have your research and plan been accepted and implemented by certain governmental department? (If no, go to question 13) 26
① Yes ② No
11. Which level of governmental department has implemented your research and plan? 27
① Central Government ② Direct District City ③ General County or City ④ Town ⑤ Village
12. Did the result of implementation match the expectation of the plan? 28
① Yes ② No
13. What is the highest budget of the plan that you have participated in before? 29
① 100,000 or less ② 110,000 to 300,000 ③ 310,000 to 500,000 ④ 510,000 to 800,000 ⑤ 800,000 and above
14. What is the lowest budget of the plan that you have participated in before? 30
① 100,000 or less ② 110,000 to 300,000 ③ 310,000 to 500,000 ④ 510,000 to 800,000 ⑤ 800,000 and above
15. What is the longest plan that you have participated before? 31
① 1 Year ② 2 Years ③ 3 Years ④ 4 Years ⑤ 5 Years

Part 5: Related Questions

Do not write beyond the dot line

1. What do you feel about the quantity of consigned disaster medicine related plans in the recent years? 32
① Increase gradually ② Reduce gradually ③ No change
2. What do you feel about the budget of consigned disaster medicine related plan in the recent years? 33
① Increase gradually ② Reduce gradually ③ No change
3. What are the difficulties for the present disaster medical research in Taiwan? (Select all if applicable) 34
① Budget shortage ② Lack of Coordination from governmental department ③ Personnel shortage ④ Lack of equipment and supplies ⑤ Ignorance by the public ⑥ Other _____
4. What is the largest constriction on the disaster medical research that you are working on? 35
① Budget shortage ② Lack of Coordination from governmental department ③ Personnel shortage ④ Lack of equipment and supplies ⑤ Ignorance by the public ⑥ Other _____

Table 2. Major investigated area of the plan

Category	Count	Percentage
Disease	8	5%
Earthquake	106	71%
Flood	52	35%
Nuclear and Biochemical	8	5%
Typhoon	44	29%
Fire	32	21%
Terrorism	13	9%
Other	21	14%
Total	150	100%

Table 3. Geographical distribution of research foci

Category	Count	Percentage
Taipei City	22	21.15%
Kaohsiung City	2	1.92%
Northern Taiwan	17	16.35%
Mid-West of Taiwan	47	45.19%
Southern Taiwan	13	12.50%
Eastern Taiwan	1	0.96%
Total	102	98.08%

Table 4. Members or staff included in research organizations

Category	Count	Percentage
50 and below	64	43.54%
61 to 100	11	7.48%
101 to 150	12	8.16%
151-200	7	4.76%
201 and above	53	36.05%
Total	147	100.00%

Table 5. Average research plans for each institute

Category	Count	Percentage
less than 5	90	66.18%
5 to 10	30	22.06%
11 to 15	5	3.68%
16 to 20	2	1.47%
21 and above	9	6.62%
Total	136	100.00%

Table 6. The mode of assessments of research plans by the public

Category	Count	Percentage
Internet	41	28.08%
Database of Department of Health	3	2.05%
Database of Emergency Medical Network	6	4.11%
Library	28	19.18%
Database of Educational Institutions	68	46.58%
Total	146	100.00%

Table 7. The level of governmental department that has implemented the research and plan

Category	Count	Percentage
Central Government	33	57.89%
Direct District City	5	8.77%
General County and City	16	28.07%
Town	3	5.26%
Village	0	0.00%
Total	57	100.00%

Table 8. Evaluation of research plan by central governmental organization

Acceptance	Number of Cases	Percentage
Very Satisfactory	44	29.72%
Satisfactory	87	58.78%
Acceptable	14	9.46%
Unsatisfactory	3	2.02%
Very Unsatisfactory	0	0%
Total	148	100.00%

Table 9. Evaluation of research plan by local governmental organization

Acceptance	Number of Cases	Percentage
Very Satisfactory	150	33.18%
Satisfactory	218	48.23%
Acceptable	80	11.06%
Unsatisfactory	4	0.88%
Very Unsatisfactory	0	0%
Total	452	100.00%

Table 10. Familiarity of central governmental organization on technical plan

Familiarity	Number of Issues	Percentage
Very Familiar	32	21.62%
Familiar	76	51.35%
Some What Familiar	37	25.00%
Unfamiliar	3	2.02%
Very Unfamiliar	0	0%
Total	148	100.00%

Table 11. Familiarity of local governmental organization on technical plan

Familiarity	Number of Issues	Percentage
Very Familiar	142	31.41%
Familiar	196	43.36%
Some What Familiar	104	23.00%
Unfamiliar	10	2.21%
Very Unfamiliar	0	0%
Total	452	100.00%

Table 12. Percentage on inclusion of disaster technical plan and its standard procedures into the operational procedures of central governmental organization

Model	Number of Cases	Percentage
Included	36	24.32%
Not Included	112	75.68%
Total	148	100.00%

Table 13. Percentage on inclusion of disaster technical plan and its standard procedures into the operational procedures of local governmental organization

Model	Number of Cases	Percentage
Included	142	31.41%
Not Included	310	68.59%
Total	452	100.00%

Table 14. The inclusion model of disaster technical plan and its standard procedures into the operational procedures used by central governmental organization

Model	Number of Cases	Percentage
Influential model from bottom to up	6	16.67%
Generalization model from top to bottom	30	83.33%
Total	36	100.00%

Table 15. The inclusion model of disaster technical plan and its standard procedures into the operational procedures used by local governmental organization

Model	Number of Cases	Percentage
Influential model from bottom to up	32	22.53%
Generalization model from top to bottom	110	77.48%
Total	142	100.00%